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Monterey, California



THESIS

**PEDIATRIC OUTPATIENT CLINIC MANPOWER
REQUIREMENT VARIABLES AT NAVY MEDICAL
TREATMENT FACILITIES**

by

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June 2000

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VARIABLES AT NAVY MEDICAL TREATMENT FACILITIES**

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis examines the variables that influence the determination of manpower requirements at Naval Medical Center San Diego and Naval Hospital Bremerton Pediatric Outpatient Clinics. The study reviews the military and civilian managed care program, the principles of Population Health Management, and the present medical model used by military and civilian facility to determine medical manpower requirement. The researcher sent survey questions via electronic mail to six senior medical staffs of the two Military Treatment Facilities MTF) stipulated above. The survey questions were formulated from the models of civilian medical facilities and the Joint Health Care Manpower Standards model, which were categorized into three themes: clinic management, clinical services provided, and manpower and personnel. Theme two - "clinical services provided," of the survey instrument and the statistical workload data Fiscal Year 1999 were used in the analysis. The results of this study showed that MTFs have shifted their perspective in determining and allocating medical manpower requirements to be more similar with the civilian sector's perspective than the military's staffing model. Therefore, historical workload data are not ideal determinants of medical manpower requirements.

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I. INTRODUCTION

A. BACKGROUND

The American healthcare costs have continued to rise at an alarming rate in the last ten to fifteen years. During 1980 to 1990, the national health spending extended to 10.3 percent annual rate. In 1993, the Health Care Financing Administration (HCFA) projected an annual growth rate of 10.1 percent in healthcare expenditures through the end of the 20th century. (Verano, January 1993)

HCFA listed the following factors affecting increased health care spending.

1. Private health insurance premiums jumped 8.2 percent in 1998, more than twice as fast as in each of the previous three years; 2.8 percent in 1995, 3.3 percent in 1996, and 3.5 percent in 1997. (Levit, Cowan, et al., January 2000)
2. The use of new medical technology in health care is the fastest growing market in the computer field, and it estimated-20 percent of health care costs are related to the processing of medical information. (Advanced Technology Program, January 1999)
3. The salaries of health care professionals that were one-fifth of all health expenditures in 1999-\$229.5 billion. The high physician-to population ratio, most notably with certain specialists, went up the same year (Levit, Cowan, et al., January 2000).
4. The escalating cost of research and development of drug therapies or biotech agents, and the demand for new prescription drugs to be in the market with less time to test it by Food and Drug Administration soared the spending on prescription drugs to \$90.6 billion in 1998 (Ibid.).
5. The persistent increase of state and federal regulations of health plans adds to the cost of health care. (Hughes, June 1999, p. 2)

6. The estimated cost of medical liability, malpractice, and defensive medicine consumes 50 billion health care dollars a year (Ibid., p. 1)
7. The expenses for hospital, nursing homes, and home health accounted for 35.5 percent of national health spending in 1998 (Levit, Cowan, et al., January 2000).

The rise in healthcare costs, the demand of payors (government, employer groups, and patients) for greater value for the money spent on medical services, the proliferation of Internet healthcare sites, and consumers' demand to have more information has lead to the expansion of managed care and the application of Population Health Management (PHM) principles (Rabinowits, July 1998). One of the resulting ramifications has been the difficulty in determining the numbers and mix of personnel to support to these new approaches to the delivery of care (Futch, March 1997). Staffing models generated solely based on providing episodic care are inadequate. The application of managed care principles now focuses on enhancing the health status of the enrolled population in addition to providing episodic care (Gillert, 4 February 1999).

The Military Health System (MHS) has historically conducted retrospective reviews of workload to determine the quantitative and qualitative values ("mix") of medical staff (Gillert, 7 July 1999) using the Joint Healthcare Manpower Standard (JHMS) (JHMS DoD-6025 STD, September 1992). Shore Manpower Requirements Determination Process (SMRDP), previously known as the Efficiency Review (ER) Process is a systematic process that reviews, measures, and assesses workload used by JHMS in terms of the activity's directed missions, functions, and tasks (OPNAVINST 1000.16J, January 1998).

Some civilian medical organizations have attempted to build new staffing models that address the complexity now facing medical executives (Futch, March 1997). In the civilian sector they utilize manpower requirement models that take into consideration: disease intensity, the amount of time spent with the patient, the number of enrolled population, and the number and mix of available providers.

The military has not yet developed a manpower staffing model for delivering peacetime healthcare services in this new environment. The drive to find the right "mix" is further complicated within the Military Health System (MHS) because of the dual missions of meeting operational medical needs while providing peacetime care for service members and their beneficiaries through the military's managed care program called TRICARE. (GAO, June 1996)

The purpose of this thesis is to identify the variables or factors influencing the decisions of executive managers to staff medical work centers. It discusses how a managed care program impacts daily healthcare operations. It also discusses the Department of Defense (DoD) Joint Healthcare Manpower Standard (JHMS) model, and the limitations of using historical workload data to determine staffing requirements.

B. RESEARCH QUESTIONS

The primary research question this thesis focuses on is: "What variables influence the determination of manpower requirements at large and medium Navy medical outpatient pediatric clinics?" To answer the primary thesis question, two subsidiary questions will be addressed:

- How does the TRICARE managed care program affect medical manpower requirements with respect to delivering the necessary healthcare for both military members and eligible non-military beneficiaries?

- How do the principles of Population Health Management (PHM) influence the military healthcare delivery system and the structure of military medical manpower?

C. SCOPE AND LIMITATIONS

The scope of this thesis is limited to pediatric outpatient clinics at a large (1,000 beds) and a medium-size (104 beds) military hospitals. Naval Medical Center San Diego-large MTF and Naval Hospital Bremerton-medium MTF were the two military hospitals selected to participate in the study. It examined the current practices of the outpatient pediatric clinics of these facilities as well as the possible relevant effects of managed care, population health management principles, and the new military medical doctrine of Force Health Protection program in the determination and allocation of staff.

D. METHODOLOGY

Publications, memoranda from Department of Defense, Office of the Secretary of Defense (Health Affairs), and directives from Bureau of Medicine and Surgery (BUMED) were reviewed. A comprehensive review of the United States Managed Care System (MCS), Military Health System (MHS), principles of Population Health Management (PHM), Joint Healthcare Manpower Standard (JHMS), and military and civilian workload outpatient models was performed. Additionally, a historical overview of the military's process to determine manpower requirements is presented.

Data was gathered through survey questions, followed-up with personal and electronic mail interviews with the Director of Pediatric Department, Director for Nursing, and Nurse Division Officer for Pediatric Outpatient Clinic for Naval Medical Center San Diego and Naval Hospital Bremerton. Data from the survey questions were

divided into three separate themes: clinic management; clinical services provided; and manpower and personnel.

E. ORGANIZATION OF STUDY

Chapter II provides an overview of the factors influencing the cost of health care, the characteristics of managed care, and the application of PHM principles in the MHS. Additionally, the concept of military manpower workload standards is described as is the on-going development of civilian manpower workload models for the healthcare industry.

Chapter III is the presentation of data and methodology gathered from NMCSD Pediatric Outpatient Department and the NH Bremerton Pediatric Outpatient Clinics to support this thesis. Chapter IV presents the analysis of findings from the key personnel interviewed. Chapter V provides the conclusion and recommendations for this research.

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II. HEALTH CARE SYSTEM OVERVIEW

A. CHAPTER OVERVIEW

This chapter introduces factors influencing healthcare costs of the United States Health Care System (HCS). It will identify the characteristics of a Managed Care System (MCS), as well as define a Health Maintenance Organization (HMO) and its impact on “quality of care” for patients. It will also give an overview of how the healthcare delivery system has moved from focusing on episodic care for patients to assessing and enhancing the health of an enrolled population through the principles of population health management (PHM). Additionally, this chapter describes how PHM principles influence the Military Health System (MHS) by implementing the Force Health Protection doctrine.

Subsequent sections will review the official approach of staffing the MHS through the Joint Health Care Manpower Standard (JHMS). They will also address the structure and functions of the Navy Bureau of Medicine and Surgery (BUMED) manpower. Lastly, these sections will address how outpatient workload is documented in the military and civilian outpatient¹ clinics.

B. FACTORS INFLUENCING HEALTH CARE COSTS

The United States Health Care System (HCS) has changed over time due to the increase in national health spending from 13.2 percent of the gross domestic product in 1991 to 18.1 percent in 1998 (Verano, January 1993). Three major components that

¹ Outpatient clinic – another name for outpatient clinic that will be used interchangeably is the word ambulatory clinic.

influence these changes are (1) a diverse population; (2) advances in medicine; and (3) a demand for more value for the money spent by payors (Verano, January 1993).

According to the study of the Health Care Financing Administration (HCFA), the United States population growth is declining. However the population's composition is changing. The study showed that Americans aged 65 and older spend four times more in healthcare as do people less than 65 years of age. The study projected that by 2030, the population of Americans aged 65 and older would comprise of 20.1 percent and for age 75 or more it would be 9 percent. This should result in more dependence on government programs, thereby increasing healthcare expenditures. (Verano, January 1993)

Advances in medicine, which includes the cost of research and development of drug therapies and biotech agents, contributed to the growth of prescription drugs from 8.7 percent in 1993 to 15.4 in 1998 (Levit, Cowan, et al., January 2000). Twenty percent of healthcare costs presently relate to the processing of medical information and the use of new medical technology in health care (Advanced Technology Program, January 1999). Uses of information technology in the healthcare market such as "patient monitoring, financial information tracking and analysis, clinical decision support systems, consumer health information, and education system" contributes to the increase cost of healthcare (Advanced Technology Program, January 1999).

The payors demand for more value for their money spent for healthcare changed the health plan regulations for states and at the federal level (Levit, Cowan, et al., January 2000). In 1998, the cost of private health insurance premiums went to 8.2 percent (Levit, Cowan, et al., January 2000). Moreover, the employers' have increased their demand for good information in order to compare the overall healthcare cost regarding healthcare

plans, doctors, and hospitals (Sneider, November 1997). The demands by healthcare consumers for more quality initiatives and outcomes measurements are also reasons for insurance agencies to pay more on healthcare costs (Sneider, November 1997). These demands caused private health insurance premiums to increase from 3.5 percent in 1997 to 8.2 percent in 1998 (HHS News, January 2000).

Besides the three major components influencing these changes, other factors such as the wages of health care professionals account for a large percentage of healthcare costs. In 1999, wages totaled one-fifth of all health expenditures (Levit, Cowan, et al., January 2000). In addition, the payment for physician services increased from an averaged of 4.5 percent annually in 1992 through 1998 to now 5.4 percent within the last three years (Levit, Cowan, et al., January 2000). Moreover, the medical liability, malpractice, and defensive medicine expenditures consumes an estimated cost of 50 billion health care dollars every year (Hughes, May 1999). Lastly, in spite of decreased hospital visits and more stringent provisions and utilization for nursing homes and home health care, healthcare costs for these services still escalated (Levit, Cowan, & et. al., January 2000).

C. CHARACTERISTICS OF A MANAGED CARE SYSTEM (MCS)

Managed Care System (MCS) is the “systematic integration and coordination of the financing and delivery of health care. Under MCS, there are health plans that provide their members with prepaid access to high quality care at relatively low cost. The health plans may rely on physician gatekeepers and prior authorization mechanisms to minimize unnecessary or inappropriate utilization” (Grimaldi, May 1999).

There are various kinds of managed care plans in MCS. Health Maintenance Organizations (HMOs) and Preferred Provider Organizations (PPOs)² are the two most common forms of managed care organizations (Mcleod, July 1993). HMOs behave as the health insurer and health care delivery system (Wagner, July 1996). HMOs employ or contract with medical groups to provide a full range of health services to their beneficiaries. HMOs have three different kinds of health plan models: Group Model HMO, Staff Model HMO, and Independent Practice Association (IPA) Model HMO. (Mcleod, July 1993)

Group Model HMOs contract with freestanding medical groups of physicians to provide coordinated care for large numbers of HMO patients for a fixed, per-member fee and may continue to treat their private fee-for-service patients. These groups commonly provide services to several HMO. Staff Model HMOs provide healthcare through physicians and other health professionals who are employed on a salary basis. IPA Model HMOs contract with independent physicians who work in their offices and receive a per-member payment or capitation from the health maintenance organization to provide a full range of health services for HMO members. (Mcleod, July 1993)

The medical care for HMO members is directed by Primary Care Managers (PCMs) also called "gatekeepers" who accept the responsibility and risk for coordinating patient care. "Gatekeepers" handle the referral management by assessing the enrolled member to see if a specialist is required, or whether the PCM can provide the service. Under the managed care system, PCMs accept to take some financial risk for providing

² PPO is a network of health professionals who concur to provide medical care to plan members at a discounted rate.

healthcare and following the guidelines, protocols, and utilization management (UM) criteria established by managed care contractors. (Grimaldi, May 1999)

HMO health plans have various techniques to monitoring the amount and appropriateness of health services used by its members. The process is called utilization management (UM). The essential element of UM is the clinical practice audit, which uses established medical appropriateness criteria³ for pre-admission, concurrent or retrospective. The clinical audit process includes a continuing process of assessment to identify if a patient's condition is of sufficient reason for admission. Another audit process is the continuing assessment to identify if certain severity of illness is suitable for the patient's length of stay and the intensity of service provided. The last clinical audit process includes a continuing process of evaluation in the delivery of service where admission, the length of stay, and intensity of service is appropriate. (Memorandum OASD (HA) 15 April 1998)

Continuing clinical audit coupled with attention to health enhancement services, such as preventive medicine⁴, disease management⁵, and annual survey of patients are the ways HMO can succeed, satisfy their members, and contain the cost of healthcare. (Integrated Healthcare Association, no month 1997)

Although HMO handles health care financing and a health care delivery system, it has its own advantages and disadvantages. The advantages include lower out-of-pocket

³ Medical appropriateness criteria are clinical indicators that have been developed in order to assess the appropriateness of decisions and treatments in the patient care process.
(<http://cdnhealthcare.com/mcump2.html>)

⁴ Preventive medicine is an approach to health care which emphasizes preventive measures such routine physical exams, diagnostic test (i.e. Cholesterol Testing, Blood Pressure Testing), immunization and others.

⁵ Disease management is an approach to health care delivery that proactively identifies populations at risk for established medical conditions such as diabetes, asthma, high blood pressure, and others.

expenses, less paperwork, more comprehensive benefits (including some prescription drug coverage), a focus on prevention, and continuity of care. The disadvantages include limited choices for covered members if the patient's doctor is not part of the managed care network. (Managed Care Web Site, August 1998).

Managed care changed the healthcare delivery and contained healthcare costs. Managed care also expanded the physician's relationships to be with not only the patient but also the payor of the benefit as well as his/her employer. (Wolford, Brown, et. al. January 1993)

D. POPULATION HEALTH MANAGEMENT (PHM) PRINCIPLE

Population Health Management (PHM) is an approach toward national health delivery that deals with the incidence, distribution, and control of disease in a population. It started in 1979, when the Surgeon General's Report "*Healthy People, and Healthy People 2000: National Health Promotion and Disease Prevention Objectives*," was published. (Healthy People Web Site, January 2000)

After the report of Healthy People 2000, individuals and organizations nationwide teamed up and developed a program called "Healthy People 2010." The intention of "Healthy People 2010" is to serve as a design for improving the health of the United States population in the first decade of the 21st century. The main goals of "Healthy People 2010" are to "increase quality and years of healthy life and eliminate health disparities." To accomplish these goals, "Healthy People 2010" developed 467 objectives from 28 focus areas, such as cancer, chronic kidney disease, maternal, infant, and child health, tobacco use, substance abuse, sexually transmitted diseases to improve the health of the population. Organizations and institutions such as schools, colleges,

civic and religious organizations, businesses, as well as the military are encouraged to embrace the objectives and modified it to suit the needs of their community. (Healthy People Web Site, January 2000)

To achieve the Healthy People 2010 objectives healthcare organizations have to modify the medical manpower composition. For example, Dr. Randy Martin, associate dean for Clinical Development at Emory Healthcare in Atlanta, Georgia, emphasized to primary care physicians, nurses, and health care organizations to educate and encourage patients to have as much knowledge about healthcare as they can. This would mean to have medical personnel educating, showing behavioral risk patterns that contributed to the illness, managing the disease condition, and measuring outcomes. (Rabinowitz, July 1998)

The Military Health System is already in progress of assessing the needs of the population and understanding the health risks of military members and their beneficiaries. In 1999, during the TRICARE Conference, Air Force Lieutenant General (Dr.) Charles Roadman expressed that the application of PHM principles to military members and their beneficiaries has contributed to the execution of the military's new medical doctrine called Force Health Protection. (Gillert, 4 February 1999)

E. FORCE HEALTH PROTECTION (FHP)

Force Health Protection is the United States military's medical doctrine. FHP focuses on improving and protecting the health of the Armed Forces while at home and during deployment (Memorandum OASD (HA), 1 April 1998). The major factors of FHP include ensuring a healthy and fit force; prevention of wounds and injuries; and casualty care and management (Memorandum OASD (HA), 1 April 1998).

The Assistant Secretary of Defense for Health Affairs statement during the First Session, 106th Congress was that FHP is an approach to protect service men and women from the beginning of their military careers, to training and deployments, to separation or retirement, and beyond. Full protection for the Armed Forces personnel is important because of unpredictable global threats and the fear of various environmental and hazardous warfare agents during deployment. Moreover, a service member would be more able to focus on the job if his or her family is believed to be receiving quality healthcare. In order for the FHP to work in wartime, a robust peacetime health care system is necessary. (Bailey, March 1999)

F. MILITARY HEALTH SYSTEM (MHS)

Military Health System (MHS) integrates all aspects of health services for DoD eligible beneficiaries for both military active duty and retirees, and their family members. The mission of MHS is to provide medical services and support to the armed forces during military operations. In addition, MHS provides continuous peacetime medical services to members of the armed forces and their beneficiaries. MHS delivers health care services through Military Treatment Facilities (MTFs) and other associated military and civilian clinics. (MHS Strategic Planning Web Site, January 1999)

The MHS began ways to improve access to quality medical care while containing cost in 1980. A major step forward to improve access to the military's medical system came from the project of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) Reform Initiative (CRI) that started in California and Hawaii in 1988. The CRI project was presented to military service families, who were given a choice on how to use their military health care benefits. Military service families were

satisfied with the project and within five years, DoD officials were persuaded to improve and expand the concept of CRI nationwide, with a new program now called TRICARE. (TRICARE OASD Web Site, November 1999)

TRICARE offers the military member a choice of the type of health care benefit plan suited for needs of his or her family. The health care benefit plans are:

1. "TRICARE Prime, which is a health maintenance organization (HMO) -type source of health care that comes from MTF with the augmentation of the Preferred Provider Network (PPN).⁶ All active duty personnel and their family members, retirees and their family members and survivors under age 65 are eligible to enroll in TRICARE Prime. Members have to complete an enrollment form and there is no fee for enrolling. Health care needs are provided by Primary Care Managers (PCM) (team of providers) that coordinate and provide the necessary care; maintains medical record; and if necessary, refers the member to provider specialist.
2. TRICARE Extra is an option with a choice of doctor, hospital, or other medical provider listed in the TRICARE Provider Directory. Eligible members for TRICARE Extra are active duty family members, retirees and their family members and survivors under age 65, except for active duty personnel who are automatically enrolled in TRICARE Prime. There is no enrollment fee, no PCM, provider choice is limited, and patient must pay for deductible⁷ and copayment⁸ of five percent less than TRICARE Standard.
3. TRICARE Standard (the new name for CHAMPUS) is an option in which the patient can see the authorized provider of their choice but it generally costs more. Eligible members are the same as in TRICARE Extra. Members pay for deductible, copayment, and for bills that exceed the allowable charge and pays 15 percent more if the provider is non-participating in the TRICARE Provider Directory. Beneficiaries have to do their own work and file their own claims. Treatment in MTF is available after all the TRICARE Prime patients have been served." (TRICARE Brochure Web Site, February 1997)

⁶ Preferred Provider Network (PPN) is a group of civilian providers organized by TRICARE contractor to supplement military direct care in TRICARE Prime and Extra members. PPN members must meet the same professional standards as MTF providers, offer discounts for TRICARE users, and file patients' claims (TRICARE Brochure Web Site, February 1997).

⁷ Deductible is an annual amount that a patient must pay out of his/her pocket for care before CHAMPUS begins to share costs for outpatient care (TRICARE Brochure Web Site, February 1999).

⁸ Copayment/Copay/Cost Share is a certain portion of the cost of care, which the patient must pay even for care covered by CHAMPUS (TRICARE Brochure Web Site, February 1997).

TRICARE is a regionally managed care program, which incorporates the financing and delivery of health care services to military beneficiaries. TRICARE combines the medical resources of Army, Air Force, and Navy with the addition of civilian health care providers to obtain the best quality health care access and delivery. The United States-based MHS is divided into 12 Regions. The 12 regions have five TRICARE managed care contractors. These are Foundation Health Federal Service (FHFS), TRIWEST Healthcare Alliance (TRIWEST), Anthem Alliance, Humana, and Sierra Military Health Services. (TRICARE/CHAMPUS Policy Manual 6010.47-M, December 1998)

Foundation Health Federal Service (FHFS) is the managed care contractor for the West Coast, which consists of Regions 6, 9, 11, and 12. The FHFS serves TRICARE eligible beneficiaries to the following states: Arkansas, Oklahoma, Texas, Southern California and Yuma, Arizona, Northern California, Oregon, Washington, and six counties of North Idaho, Pacific and Alaska (Foundation Health Federal Services, Inc., Web Site, No Date).

TRIWEST Healthcare Alliance (TRIWEST) is the managed care contractor for TRICARE Central, Regions seven and eight. The states TRIWEST serves to are Arizona, Missouri, Montana, Nebraska, Nevada, New Mexico, North and South Dakota, Texas, Utah, and Wyoming. (TRIWEST Web Site, no date)

Anthem Alliance is the managed care contractor for the East Cost Region, which consist of two regions: Region 2 and Region 5. Anthem Alliance serves the eligible beneficiaries in the following states: Illinois, Indiana, Kentucky, Michigan, Ohio, West Virginia, Ohio, West Virginia, Wisconsin, the St. Louis area of Missouri, and the Fort

Campbell area of Tennessee, and TRICARE Mid-Atlantic Region (North Carolina and most of Virginia). (Anthem Alliance Web Site, 1999)

Humana is the managed care contractor for regions three and four. It serves the eligible beneficiaries in the following states of Alabama, Florida, Mississippi, Tennessee, Georgia, South Carolina, and for New Orleans, LA. (Humana Web Site, no date)

Sierra Military Health Services is the managed care contractor for region one. The company also serves TRICARE beneficiaries in Nevada and portions of Missouri.

The MTFs in this thesis are located in Region 9 and Region 11. Region 9 consists of Southern California and Yuma, Arizona. Region 11 consists of the states of Washington, Oregon and the six northern counties of North Idaho. (Foundation Health Federal Services, Inc., Web Site, No Date)

The Office of the Assistant Secretary of Defense, Health Affairs (OASD (HA)) established within each region a military medical personnel called "Lead Agent" (the commanding officer of a major military medical center in the region) with responsibility of coordinating the health delivery systems of each of the military services (Memorandum OASD (HA), November 1995).

The "Lead Agent" for Region 9 is the Commander of Naval Medical Center San Diego, California and for the "Lead Agent" for Region 11 is the Commander of Madigan Army Medical Center in Tacoma, Washington. (Foundation Health Federal Services, Inc., Web Site, No Date)

The responsibilities of "Lead Agent" were delineated by the OASD (HA). One of the responsibilities of the "Lead Agent" is to coordinate with TRICARE the managed care contractor in the region. Their responsibilities involve supporting medical readiness

operations through provisions of managed care support contract; developing and executing regional health services plans; monitoring and analyzing regional business management; and facilitating and collaborating with other MTFs, service Surgeon Generals and the DoD Health Affairs Office. (Memorandum OASD (HA), November 1995)

The contractual mechanisms available to MTF command officers are Resource Sharing Agreement (RSA) Program and Resource Support. The objective of the RSA program is to augment the services provided at a MTF either by medical personnel support, equipment and supplies to deliver healthcare to active duty members and TRICARE beneficiaries in a network facility. Resource Support allows the MTF to use their money to have the contractor buy a specific provider for a specific function within the command. (TRICARE Manual Operations Part 3, 6010.47-M, February, 2000)

Another responsibility of the “Lead Agent” is to collaborate with and support MTFs to manage the enrollment capacity for TRICARE Prime enrollees, which is affected by the available number of Primary Care Managers (PCM)⁹ at the MTF. The goal of the enrollment capacity of eligible beneficiaries is to optimize the resources of MTFs and to recapture the appropriate workload within the network. The approximated enrollment per provider is 1,500 patients. Enrollment capacity ratio is influenced by four factors: demand, productivity, availability, and readiness considerations. (Memorandum OASD (HA), March 2000)

⁹ Primary Care Manager (PCM) – could be Family Practitioners, Pediatricians, or other medical professionals such as Physician Assistants (PAs), Nurse Practitioners (NPs), and Independent Duty Corpsmen practicing under the supervision of a physician with the following responsibility: routine care; possible referrals for test and specialty care; and monitor adequacy and continuity of care for the eligible patients (TRICARE OSD Brochure Web Site, February 1997).

The first factor is managing the demand for healthcare, which includes the use of “nurse advice lines,¹⁰ prevention measures, and nurse triage system” according to Bailey (2000). Second factor is the productivity of the medical facility, which would require having suitable support staffs, adequate number of examination rooms in the clinic, and satisfactory scheduling systems. Third is the availability of sufficient number of primary care providers that should staff the MTF in order to increase the amount of enrollees. Lastly, the MTF’s primary function is to respond to contingency requirements, therefore it must continue to balance the demands of the military medical readiness mission with its responsibilities to the enrolled population of non-active duty personnel. (Memorandum OASD (HA), March 2000)

G. JOINT HEALTHCARE MANPOWER STANDARDS (JHMS)

OASD (HA) authorized the Military Health System (MHS) to publish JHMS DoD 6025.12 STD on September 1992. JHMS is a directive to all military medical services that provides Work Center Description (WCD), Joint Healthcare Manpower Table, and standard man-hour equations. (JHMS DoD 6025.12 STD, September 1992)

The WCD describes the tasks performed during a specified period of time. An example of a WCD is the Navy Pediatric Outpatient Clinic and the focus of this thesis. The WCD is divided into two sections, direct patient care and indirect patient care. The direct patient care section consists of outpatient and inpatient healthcare and clinic administration. Direct patient care tasks include taking patient blood pressure, pulse, respiration, and weights; administering medication, assessing patient condition and

¹⁰ Nurse advice lines are provided by a Registered Nurse over the telephone and Internet to patients with health concerns. An advice nurse will discuss health-related questions, such as how to deal with injured ankles, sore throats, immunizations, medications, and specific disease processes. (Lifelines for Quality of Life Web Site)

intervention when appropriate, and obtaining laboratory specimens. Clinical administration involves scheduling of patients, clinical meetings, updating policies and procedures, developing and revising quality assurance programs, and supervising and administering training for healthcare personnel. Indirect patient care consists of verifying patient records, teaching hospital corpsmen, preparing examination rooms, and maintaining supplies and equipment. (JHMS DoD 6025.12 STD, September 1992)

The Joint Healthcare Manpower Table lists the number and proper mix of staff necessary to perform the tasks described at the work center. The number and proper mix of staff could only be extrapolated from the result of the computation described in Tables 1 and 2. The Joint Healthcare Manpower staffing table has four categories: military and civilian providers; registered nurses; medical technicians; and administrative/clerical personnel. (JHMS DoD 6025.12 STD, September 1992)

JHMS directive has two standard man-hour equations that calculate the quantitative mix of staff for the pediatric work center service for peacetime environment only. An inpatient (bedded) facility is a MTF that has an overnight hospital capability, such as the two MTF organizations for this thesis. Table 1 is for a pediatric inpatient (bedded) facility. (JHMS DoD 6025.12 STD, September 1992)

Table 1. Standard Man-hour Equations for Pediatric Service Work Center (Bedded Facility)

$Y_c = 609.8 \text{ hours/month} + 0.2258(X_1) + 4.368(X_2)$	
Y_c	Represents the number of manpower for the pediatric department work center after X_1 and X_2 are calculated within a month.
609.8 hours/month	Represents the constant fixed amount of monthly hours for a Pediatric bedded facility Work Center (WC) to function either with or without a patient.
X_1	Represents the Workload Factor (WF) of average monthly number of total Pediatric Patient Visits. The source comes from Medical Expense Performance Reporting System (MEPRS) Codes reported as total Pediatric Outpatient Visits.
X_2	Represents the average number of total Pediatric Occupied Bed Days of a patient in the hospital. The source comes from MEPRS Codes reported as total Pediatric Inpatient Visits.
WF	Workload Factor (WF) is a work unit in a work center at a given period of time such as number of patients seen in a month. The source of WF in military medical system is from MEPRS.
WC	Work Center (WC) is the military treatment facility Pediatric Department.

Source: Joint Healthcare Manpower Standard DoD 6025.12 STD, September 1992

An outpatient (non-bedded) facility is a MTF with no overnight hospital capability. Table 2 is for a pediatric outpatient (non-bedded) facility.

Table 2. Standard Man-hour Equations for Pediatric Service Work Center (Non-Bedded Facility)

$Y_c = 191.6 \text{ hours/month} + 0.5541(X_1)$	
Y_c	Represents the number of manpower for the Pediatric Department work center after X_1 is calculated within a month.
191.6 hours/month	Represents the constant fixed amount of monthly hours for Pediatric non-bedded facility Work Center (WC) to function either with or without a patient.
X_1	Represents the Workload Factor (WF) of average monthly number of total Pediatric Patient Visits. The source comes from MEPR Codes reported as total Pediatric Outpatient Visits.

Source: Joint Healthcare Manpower Standard DoD 6025.12 STD, September 1992

MEPRS provides consistent principles, standards, policies, definitions, and requirements for accounting and reporting expenses, manpower requirements, and personnel performance by DoD fixed military medical facilities. The MEPRS codes for the two MTF Outpatient Pediatric Clinics used for this thesis are BDAA-General Pediatrics, BDAB- Developmental Pediatrics or Pediatric Sub-Specialties (depending upon the WCD for MTF's), and BDBA – Adolescent Clinic. Each of the codes for MEPRS is MTF specific. These MEPRS codes carry the number of total patient visits and used to calculate the manpower requirement standards. (JHMS DoD 6025.12 STD, September 1992)

**H. NAVY BUREAU OF MEDICINE AND SURGERY (BUMED),
MANPOWER**

The manpower claimant for Navy medicine is under the supervision of the Chief, Navy Bureau of Medicine and Surgery, 18 (BUMED-18) (OPNAVINST 1000.16J, January 1998). A manpower claimant is the major commander or bureau (such as BUMED-18) that authorize manpower resources to accomplish the assigned missions, functions, and tasks. Manpower claimants review, measure, and assess workload in terms of the activity's Missions, Functions, and Tasks (MFT) for peacetime and wartime (OPNAVINST 1000.16J, January 1998). In addition, the claimant determines the required explicit medical skill level necessary to staff the medical facilities and have the flexibility to execute Shore Manpower Requirements Determination Process (SMRDP), such as establishing its own manpower requirements determination team or contracting out the functions of SMRDP (OPNAVINST 1000.16J, January 1998).

The mission of BUMED-18 consists of supporting medical readiness as assigned by CNO, developing health care policy and providing technical support for all shore-based treatment facilities and Operating Forces of the Navy and Marine Corps, and managing the use of TRICARE. The medical readiness (wartime) mission encompasses the deployment of medical personnel to the Fleet, Fleet Marine Forces and forward deployed units. The benefits (peacetime) mission supports health care to 8.1 million¹¹ beneficiaries through direct care and TRICARE managed care program. (OPNAVINST 5450.215A, September 1997)

BUMED-18 uses JHMS standards to calculate the required medical manpower requirements for Navy MTFs (JHMS DoD 6025.12 STD, September 1992). Approximately 75 percent of the BUMED-18 medical billets are directed requirements. The remaining 25 percent are determined and managed by claimants with "war fighting" missions such as, Commander-in-Chief Pacific Fleet, Commander-in-Chief Atlantic Fleet, and the Fleet Marine Force. (Telephone conversation, Jonak, December 1999)

A subsection of BUMED-18 is Bureau of Medicine and Surgery, Manpower Division, 15 (BUMED-15). The role of BUMED-15 is to analyze, coordinate, and implement the peacetime and wartime mission of medical manpower. BUMED-15 supervises the SMRDP process, formerly called Efficiency Review, which is located in Norfolk, Virginia. (BUMED-15 Web Site, November 1998)

SMRDP process determines new requirements and validates an organizationsexisting requirements in accordance with their missions, functions, and

¹¹ According to the Annual Report to the President and Congress by Secretary of Defense (2000), the current eligible beneficiaries of MHS is 8.1 million.

tasks statement. An organization's requirements are delineated in the "Statement of Manpower Requirements" (SMR).¹² Requirements are based on minimum quantitative and qualitative requirements to meet day-to-day peacetime missions (OPNAVINST 5450.215A, September 1997). However, for medical readiness requirements, the Total Health Care Support Readiness Requirements (THCSRR) model it establishes the baseline for manpower requirements (Weber, September 1994). It is also the model used to assign BUMED personnel to its MTFs.

The National Defense Authorization Act (NDAA) for Fiscal Years 1992-1993, required MHS to determine the size and composition of the military medical system needed to support United States forces during wartime and provide cost-effective delivery of medical care to the beneficiary population during peacetime. THCSRR model is the Navy medicine's response to "Section 733 of the NDAA Study." (GAO, June 1996)

THCSRR model has two fundamental components. The first component calculates the minimum active duty manpower readiness requirements for wartime and day-to-day operational support. The second component includes the sustainment requirements needed to maintain the readiness manpower requirements for future years. Although, the THCSRR model determines manpower resource requirements in support of medical readiness missions, military medical staffs provide health care to eligible beneficiaries. These manpower requirements for peacetime health care missions are determined by SMRDP in conjunction with TRICARE managed care programs. (Weber, September 1994)

¹² Statement of Manpower Requirements (SMR) is an approved qualitative and quantitative peacetime manpower requirement for shore activities (OPNAVINST 1000.16J, January 1998).

I. OUTPATIENT WORKLOAD REQUIREMENTS

Navy medicine uses the average monthly number of total patient visits as a workload factor input in calculating the manpower requirements directed from JHMS standards (JHMS DoD 6025.12 STD, September 1992). The Manual of Navy Total Force Manpower Policies and Procedures defines workload as the “amount of work, identified by the number of work units or volume of a Workload Factor (WF), that a work center has on hand at any given or specified time (OPNAVINST 1000.16J, January 1998). The Naval Medical personnel are assigned 145.136 average hours per month per individual to perform primary duties (OPNAVINST 1000.16J, January 1998).

Table 3. Manpower Requirements Calculation

WF	Workload Factor (WF) is a work unit in a work center at a given period of time such as number of patients seen in a day.
WAF	Work-hour Availability Factor (WAF) is the average number of work-hours per month an assigned individual is available to perform primary duties.
$\frac{WF}{WAF} = \text{Number of Manpower Requirements}$	

Source: Manual of Navy Total Force Manpower Policies and Procedures (OPNAVINST 1000.16J January 6, 1998).

The 145.136 hours per month is the work-hour availability factor (WAF). The Navy medical manpower requirements are determined by dividing WF by WAF and are shown in Table 3 (OPNAVINST 1000.16J, January 1998).

1. Medical Expense Performance Reporting System (MEPRS)

Military medical facilities currently use the Medical Expense Performance Reporting System (MEPRS) to calculate the historical workload data of patient visits for inpatient and outpatient clinics. The MEPRS system was developed to achieve uniform staffing standards for all DoD components. In addition, DoD developed the MEPRS to provide consistent policies, definitions, and requirements for the accounting and reporting of expense, manpower, and performance of DoD fixed military medical facilities. The MEPRS captures the information in a standard format by defining a functional work center, applying a uniform performance measurement system, and prescribing a cost assignment methodology. (MEPRS DoD Directive 6010.13M December, 1986)

MEPRS data, which is the number of patient visits are used in the Joint Health Care Manpower Standard (JHMS) as a workload factor for inpatient and outpatient settings to quantify manpower requirements (JHMS DoD 6025.12-STD, September 1992). MEPRS data provides a retrospective way to capture workload and does not reflect the total number and specialty mix of health care providers in the ambulatory care setting. Other workloads factors, such as increased walk-in visits, unexpected amount of time spent for telephone triage, and trauma care, are not captured by the MEPRS system (JHMS DoD 6025.12-STD, September 1992).

The Air Force changed the method of computing their manpower requirements for primary care areas such as Family Practice Clinic, Internal Medicine Clinic, Pediatric Clinic, and Obstetrics/Gynecology Clinic. According to Major Susan Hall (1999), the primary medical care areas of Air Force (AF) MTF use the Enrollment Based Reengineering Model (EBRM) to determine manpower requirements. The EBRM model

is based upon a certain block of personnel for each aircraft used by Air Force. The block of medical personnel for EBRM is based on 6000 patient enrollees. (Telephone conversation, Hall, January 1999)

"The EBRM model is developed on three basic managed care strategies: maximize enrollment, manage access, and optimize resources. Maximizing enrollment relates to Maximum Achievable Enrollment (MAE) of patients to MTF. Managing access is so crucial to success that several manpower authorizations are specifically designed into the model. Lastly, a managed care organization cannot optimize its resources until they have accomplished the first two basic strategies." (US Air Force Medical Modernization, January 2000)

2. Civilian Models

This section shows civilian models of workload measurement in medical facility.

Each model mentions the variables used in measuring ambulatory workload.

Mayer (1992) explained that in ambulatory setting, the basic units of measure are not well established. Mayer defined workload, as the "productivity of a ratio that describes the relationship between units of inputs and units of output." The ratio that determines productivity can be expressed either as inputs (resources used) divided by outputs (service produced) or outputs divided by inputs. In Mayer's example of how to measure the productivity is to examine the full-time equivalents (FTEs) needed to see 120 patients per day. To measure the labor productivity of a nurse, divide the 120 patients by the total nursing hours per day. If the objective were to measure the labor productivity of an outpatient clinic, then one would divide the total patient load—120 patients—by the total labor hours of physicians, nurses, and personnel support. (Mayer, July 1992, p. 171)

Mayer further explained their total patient visits per month divided by the total number of enrolled patients determines the productivity ratio in a managed care

environment. Mayer (1992) suggested doing the productivity analysis within two to three weeks after the close of the previous month be required to capture meaningful impact and conduct proper analysis. Mayer also mentioned six variables that must be considered in planning ambulatory care staffing: (1) volume of patients; (2) complexity of patients; (3) physical design; (4) ability and skill level of staff; (5) unit-related and other activities not associated with patient care; and (6) system sophistication. (Mayer, July 1992, p. 173)

Another civilian model was from the 1996 study at QuadraMed Corporation, which Mourek and Colbert introduced the Ambulatory Resource Management System (ARMS) model. The ARMS system was developed from the ambulatory care patient classification methodology, which employs the mathematical adjustment to quantify total service provided based on three determinants: (1) patient intensity;¹³ (2) the amount of service time to the patient;¹⁴ and (3) the intensity of service to the patients¹⁵. ARMS model has three goals: staffing and scheduling; operational and fiscal management; and outcome measurement and strategic management. Therefore, knowing the quantitative value of time of service to the patient and the intensity of patient's health care needs, staffing and scheduling the clinic would be able to determined. (Mourek and Colbert, no month 1996)

An additional model was created by Henry (1999), a Medical Office

¹³ Patient intensity-refers a patient's need for labor resource consumption of the healthcare providers.

¹⁴ Amount of service time to the patient-refers to number of minutes or hours spend by the healthcare provider.

¹⁵ Intensity of service to the patients-refers to an adjusted amount of time the healthcare provider stayed with the patient. For example, the provider will have to spent more time to a patient with an acute illness. (Mourek & Colbert, 1996)

Administrator of Kaiser Permanente, who acknowledged the difficulty of acquiring a staff model due to cost-containment complexities of ambulatory care and resource allocation (Henry, January 1999). Henry used the variable of staff to provider ratio where she combined patient visits, population membership, number of providers, and visit acuity.¹⁶ Table 4 describes the staff to provider ratio model used at Kaiser Permanente.

Table 4. Kaiser Permanente Staff to Provider Ratio Model

0.54 Full Time Equivalent (FTE) per provider	0.54 is a constant ratio number of a Nurse to a Provider (for example, two providers to one nurse).
1.0 FTE per provider	1.0 is a constant ratio number of a Licensed Practical Nurses (LPNs), Medical Assistants (MAs), and Unlicensed Practical Assistants.
0.15 FTE per provider	0.15 is a constant ratio number for clerical support, which includes notification to the provider of patient's laboratory test results and management of medical paper flow.

Source: "Measuring Patient Acuity and Workload in an Ambulatory Setting," AACN Viewpoint, (Jan-Feb, 1999).

Thus, understanding the population membership, the visit acuity of the patients, and the number of available provider, the staff to provider ratio model functions appropriately on staffing the Kaiser Permanente's primary care areas. (Henry, January 1999)

¹⁶ Visit intensity is defined as the amount of patient's need for labor resource consumption. Whereas a patient with known history to the health care providers may take 15 minutes to see, a new patient that takes 20-30 minutes to see.

J. SUMMARY

This chapter described the factors affecting health care costs, characteristics of MCS, and the two most common forms of managed care plans: HMO and PPO. It described the importance of principles of Population Health Management (PHM) to the new military medicine doctrine of Force Health Protection (FHP). It showed how MHS started the TRICARE program and how it transitioned from episodic care to the principles of PHM. The chapter also described the manpower process of Navy Bureau of Medicine and Surgery, 18 (BUMED-18) and how the medical manpower standards were measured in accordance with the JHMS workload measurements. Lastly, it showed the different models used in staffing civilian ambulatory clinics.

The next chapter will present data from two military treatment facilities, showing details on how executive managers of Navy Pediatric Outpatient Clinics make decisions in obtaining their manpower resources.

III. METHODOLOGY AND SURVEY DATA

A. CHAPTER OVERVIEW

This chapter presents the methodology and data taken from two Military Treatment Facilities (MTFs): the Naval Medical Center San Diego (NMCS), California and Naval Hospital Bremerton (NHB), Washington. It shows the responses of the six participants to the 43 questions covered in the survey. The survey questions were categorized into three themes: clinic management; clinical services provided; and manpower and personnel.

B. THE SURVEY INSTRUMENT

Survey questions were formulated from the different models mentioned in Chapter II. The models were Quadra Med Corporation, Kaiser Permanente and from the model of the TRICARE Managed Care contract agreement. Some words from the Joint Healthcare Manpower Standard were used to construct the questions. The validity and reliability of the questions were not tested. The survey questions were reviewed by Branch Head of Analytic and Systems Support Subspecialty Code Management (BUMED-15) and my thesis advisors.

The survey questions can be categorized into three themes drawn from the Joint Healthcare Manpower Standards dated September 1992 and the models mentioned in Chapter II. The themes are clinic management; clinical services provided; and manpower and personnel.

Theme one, clinic management covers questions one through 12. It is addresses clinic's hour of operation; patient scheduling, appointment, consultation, and access;

patients enrollment under TRICARE Prime; and management of patient's medical records.

Theme two, clinical services provided covers questions 17 through 31. This theme includes the types of special services provided such as Exceptional Family Member (EFM) and any inpatient procedural services provided in the outpatient clinic such as post-operative dressing changes. It also includes the assessment of disease types to be able to manage as well as access requirements for TRICARE Prime. Additionally, this theme examines how clinical services were provided according to complexity of the patients' visit, volume of patients' seen, waiting time and service time to the patients.

Theme three, manpower and personnel cover questions 13 through 16 and 32 through 43. It depicts how well the total size and mix of staff requirements match the workload incurred to operate the clinic. It addresses the necessary credentials of providers¹⁷ in order to provide care to eligible beneficiaries. Additionally, it sought information regarding the clinic use of other sources to staff the clinic such as TRICARE Resource Sharing Agreements and Resource Support to meet workload demands.

C. SURVEY SUBJECTS

Survey questions were specifically given to six senior staff positions via e-mail during the month of December 1999 to January 2000 from each facility. The senior staff selected were the Director of Pediatrics Department, Director for Nursing and Nurse Division Officer for Pediatric Outpatient Clinic for NMCSD and NHB. The purpose of choosing the six senior staff personnel was because of their experience in supervision, management and their influence to make decision when it comes to staffing and

¹⁷ Providers – are considered either as Physicians, Physician Assistants (PAs), and Nurse Practitioners (NPs), RNs, and HMs providing quality health care to the military beneficiaries.

measuring workload in the Pediatric Outpatient Clinic. In addition, these individuals primarily make the bulk of the decisions regarding vision, strategy, and plans for the clinic.

The three participants of NMCSD returned the surveys. The responses of Director of Pediatrics Department and Nurse Division Officer for NMCSD were compiled as one. Two of the three subjects from NHB returned the individual surveys.

D. INPATIENT MILITARY MEDICAL TREATMENT FACILITIES (MTF)

There are three categories of MTFs in the Military Health System: (1) Medical centers, which are large tertiary care facilities, with a size of 200 to 1,000 beds, and offers complex inpatient and outpatient care; (2) Community hospitals, which are medium-sized care facilities, with a bed capacity of less than 200, and offer inpatient and outpatient care but with less complex cases than the medical center; and (3) Clinics, which are commonly small facilities with only outpatient primary care services (GAO, March 1995). Naval Medical Center San Diego and Naval Hospital Bremerton were selected for this study because they represent a large and medium-sized MTFs, accessibility of information, and the same managed care contractor.

1. Naval Medical Center San Diego (NMCSD)

NMCSD is located in the Southwest Region area and considered one of the three large Navy medical tertiary facilities. It supports United States Naval Ship Mercy, Fleet Marine Force (FMF) First Marine Division (1st MARDIV), First Force Service Support Group (1st FSSG), and has General Medical Education Programs. Although not directly related to the mission, NMCSD is also the location of other activities such as Pediatrics Specialty Advisor, Navy Nurse Corps Nursing Research, Navy Trauma Training, and

Reserve Navy Hospital San Diego Detachment 119. (NMCSD PAO Web Site, March 1999)

a. Historical Background

Naval Medical Center San Diego (NMCSD) is considered a large tertiary Military Treatment Facility (MTF). The managed care support contractor of TRICARE Region 9 is the Foundation Health Federal Services (FHFS), Incorporated. NMCSD started its Naval medical activities in 1914 as a field hospital in support of the Marines in North Island, across San Diego Bay. The former name, Naval Hospital San Diego expanded due to World War II injuries that was sent for treatment from Southeast Asia. In 1988, the new “state-of-the-art facility” was built to replace the “Pink Palace,” or the old NMCSD building. NMCSD serves a population of 500,000 eligible beneficiaries. The staff of NMCSD is composed of 4,600 military and civilian employees (NMCSD PAO Web Site, March 1999). The Pediatric Department serves 67,000 eligible children in the catchment area and outside the catchment area but within Region 9, there is 185,000 eligible children (Ibid.). The maximum capacity¹⁸ of enrollees for NMCSD Pediatric Outpatient Clinic (according to the TRICARE agreement contract) as TRICARE Prime members is 17,000 eligible enrollees¹⁹, an amount of 16,000 for active duty family members and 1,000 for retired family members (Villani, April 2000).

b. NMCSD Survey Results for Theme One – Clinic Management

Survey questions 1 through 12 of Appendix A relate to the characteristics of the Pediatric Clinic of each facility. The clinic operates 12 hours a day, from Monday

¹⁸ Capacity – as Webster dictionary defines, it is the maximum amount or number that can be contained or accommodated.

¹⁹ Eligible Enrollees for TRICARE are members of military active duty, retirees, and their family members and survivors of all uniformed services.

to Friday and eight hours a day on weekends and holidays. As necessary, Naval Reserve doctors, RNs, and HMs augment the clinic as part of their active duty drilling requirements. Table 5 elaborates the staffing for the Pediatric Outpatient Clinic (questions 9 and 10).

Table 5. Staff Assigned to NMCSD Pediatric Outpatient Clinic

Types of Staff	Current Number of Military Staff Assigned to Clinic	Number of Civilian Staff	Number of Contract Staff
a. Pediatrician	6	0	4
b. Pediatric Nurse Practitioners (PNPs)	1	0	3
c. Registered Nurses (RN's)	3	2	8
d. Hospital Corpsmen (HMs)	18	0	0
e. LPNs	Not Applicable	6	1
f. Certified Nursing Assistants (CNAs)	Not Applicable	0	
g. Respiratory Tech	0	0	1
h. Clerks	0	5	4
i. Medical Assistant	0	0	1
j. Administrative Assistant	0	4	1
j. Business Manager	0	0	1

Sources: NMCSD Questions 9 and 10 of the Survey Questionnaire dated 28 Jan 2000

To question 11, the response of two participants was yes and one respondent said no to the question about whether or not the Pediatric Outpatient Clinic met their workload requirements. As of April 24, 2000, data indicated the current beneficiaries enrolled to TRICARE Prime Pediatric Clinic was 7,342 active duty family members and 161 retired family members (Villani, April 2000). The 1999 workload indicated 116,507 patient visits, which encompassed three Medical Expense and Performance Reporting System (MEPRS) codes. These codes were BDAA – Pediatric Clinic, BDAB – Pediatric Sub-Specialties, and Adolescent – Clinic (Telephone conversation, Aquon, April 2000).

In answer to question 12, two participants answered "not applicable" for using other resources in order to meet workload requirements. One respondent mentioned that Resource Sharing Agreement (RSA) Program as their source of hiring two additional flex nurse positions for a disease management initiative for Asthma and Hematology/Oncology patients. Currently, the clinic is in the process of hiring a new RN for a Health Promotion Coordinator and a Respiratory Technician.

2. Naval Hospital Bremerton (NHB)

NHB is located in the Northwest area of Washington State and is considered one of the medium-sized medical tertiary facilities. The readiness mission of NHB is to be the parent command of Fleet Hospital Five and provide a Family Medicine Residency Program. During peacetime, NHB provides healthcare to 55,897 active duty service member and their family members; military retirees and their family members; government employees and other eligible beneficiaries through the main hospital and its five branch medical clinics (Telephone conversation, Klemman, February 2000). The total amount of staff, including the five branch medical clinic is approximately 1,200. They are comprised of active duty enlisted and officer personnel, federal government employees, contract personnel, and Resource Sharing staff. (NHB PAO Web Site, April 2000)

a. Historical Background

Naval Hospital Bremerton (NHB) is in TRICARE Region 11, whose managed care contractor is the same as Region 9, the FHFS. The beginning of NHB started when medical services were provided on the ship USS Nipsic from 1891 to 1903 at the Puget Sound Naval Shipyard, Bremerton, Washington. In 1920's to 1940's, the

hospital increased their medical services because of the growth of the Naval Shipyard. The building of the hospital remained the same for 68 years, and later moved to Ostrich Bay in 1980. It provides care to 60,000 eligible military families located within its catchments area (NHB PAO Web Site, April 2000). The current total of pediatrics TRICARE Prime patient enrollees as of April 12, 2000 is 5,479 patients (Telephone conversation, Klemann, April 2000). During an interview with the Pediatrics Department Head, he indicated that the clinics' maximum capacity is 6,200. Each of the two Nurse Practitioners (NPs) has a 1,100 maximum capacity and the four other providers carry 1,000 patients each. As of 1999, the BDAA and BDZA MEPRS code workload for Pediatric Outpatient Clinic was 17, 472 patient visits (Telephone conversation Smith, April 2000).

b. NHB Survey Results for Theme One – Clinic Management

The clinic operates 16 hours a day Monday to Friday and four hours on Saturday. Table 6 delineates the staff of NHB. As necessary, Naval Reserve physicians and HMs augment the clinic as part of their active duty-drilling requirements. The most common access for patients to the clinic is by appointment (enrolled under TRICARE Prime). Other means of access is through Emergency Room referrals, as well as referrals from other departments within the hospital, Primary Care Managers from other military facilities, and telephone encounters.

Table 6. Staff Assigned to NHB Pediatric Outpatient Clinic

Types of Staff	Current Number of Military Staff Assigned to Clinic	Number of Civilian Staff	Number of Contract Staff
a. Pediatrician	4	0	0
b. Pediatrician (Developmentalist)	0	0	2
b. Pediatric Nurse Practitioners (PNPs)	2	0	0
c. Registered Nurses (RN's)	0	1	0
d. Hospital Corpsmen (HMs)	4	0	0
e. LPNs	0	1	0
i. Medical Assistant	0	0	1

Sources: NHB Questions 9 and 10 of the Survey Questionnaire dated 28 Jan 2000

In answer to question 12 of whether the clinic meets the total workload requirements (for example the TRICARE access standards), both respondents said yes and one stated that the clinic is under enrolled.

E. THEME TWO (CLINICAL SERVICES PROVIDED) FOR BOTH MTFS

The survey questions answered for theme two are 17 through 31.

1. Question 17: How important are the variables listed on the table in the decision process of manpower requirements for the Pediatric Clinic?

For San Diego: The Director for Pediatrics and Nurse Division Officer responded that the volume of patients seen per hour, complexity of patients, and telephone triage were very important variables, while total laboratory test was not important at all. For the other variables listed such as new patient type visits, follow-up patient type visits, patient education, length of patient clinical visits, service time of patient clinical visits and waiting time of patient clinical visits were considered moderately important.

For Bremerton: One stated that the volume of patients seen per hour and total laboratory test was very important. The other respondent scored the entire variable listed on the table under moderately important, except two of the variables such as patient type visits and total laboratory test were scored as not important.

2. Question 18 and 19 are linked: Are there any clinical services provided on an outpatient basis at your clinic that was once provided on an inpatient basis. Question 19: If yes, what are these clinical services?

For San Diego: Both the Director and Division Nurse Officer responded yes and the clinical services provided are intravenous therapy, chemotherapy, and blood transfusion. The Director for Nursing did not answer the question.

For Bremerton: Both participants answered no to the two questions.

3. Question 20: What procedures were added to the clinic workload, and if there were any, did the clinic's manpower workload requirements change?

For San Diego: This question was not clear to two participants. They did not answer the question. The Director for Nursing mentioned post-operative dressing, spinal taps and intravenous therapy.

For Bremerton: Two participants indicated the procedures added to the clinic were Newborn Metabolic Screen Test, Wart Removals, Intravenous Therapy, and Spinal Taps.²⁰

4. Question 21: How do patients access the clinic's services at your clinic?

²⁰ Newborn Metabolic Screen Test is a blood test taken to find out whether the infant could manufacture the enzyme necessary to develop the thyroid hormone for the body.

Wart is the result of an infected single cell of the outer layer of the skin.

Intravenous Therapy – is giving one time dose of antibiotics and electrolytes fluid into the patient's vein.

Spinal tap - A diagnostic procedure where a sterile needle is inserted into the lower spine (L2) to collect cerebrospinal fluid for diagnostic purposes. This test can aid in the diagnosis of meningitis, subarachnoid hemorrhage, and multiple sclerosis.

For San Diego: Two participants answered, appointment as the most common means of access and walk-in as the least common. The other means of access such as telephone, referral from Emergency Room or other departments within the hospital showed no indication that access to the clinic increased. One participant did not answer the question.

For Bremerton: Both agreed on all the listed options, except for the walk-in access.

5. Question 22: By what means are the clinical services provided at your clinic?

For San Diego: This question has three choices and two participants said that clinical services were provided to the clinic “based on the TRICARE benefit package (Managed Care support contract agreement) available to eligible beneficiaries. One participant did not answer the question.

For Bremerton: Both answered that the clinical services provided to their clinic were based on the skills and interest of the military providers assigned to the clinic.

6. Question 23: Does the clinic have the capacity to provide services to other than TRICARE Prime beneficiaries?

For San Diego: All three participants responded yes that the clinic has the capacity to provide services to TRICARE Extra and TRICARE Standard beneficiaries.

For Bremerton: One answered no and the other states yes on a “space available” basis.

7. Question 24: Are the TRICARE Prime access standards being met at your clinic?

For San Diego: Two responded yes and one did not answer the question.

For Bremerton: Both participants said yes.

8. Question 25: Did the requirement to meet TRICARE Prime access standards involve bringing additional staff into the clinic?

For San Diego: Two participants responded yes and one did not answer the question.

For Bremerton: Both participants said no.

9. Question 26: Do your physicians also provide care for inpatients?

For San Diego: Two responded yes and one did not answer the question.

For Bremerton: Both participants answered yes.

10. Question 27: Does the clinic provide special clinical services?

For San Diego: Three participants said yes: Exceptional Family Member Program, Adolescent Clinic, Well-Baby Check-up, and they included Oncology-Hematology and Pediatric Asthma Case Coordination.

For Bremerton: The respondents differed on their responses on Adolescent Screening and Overseas Screening Services. The rest of their responses were consistent: Exceptional Family Member Program and Well-Baby Clinic.

11. Question 28: Is the clinic responsible for implementation of the Health Promotion Program for a specific enrolled population?

For San Diego: Two responded no and one did not answer the question.

For Bremerton: The two respondents answered: in the “near future” the clinic would be responsible for implementation of the Health Promotion Program for a specific enrolled population.

12. Question 29: Is the clinic involved in any disease management or health promotion activities?

For San Diego: Three responded that their clinic is involved in disease management or health promotion activities. Their response on question 28 seems to be inconsistent with this question.

For Bremerton: One respondent said yes and the other participant said no.

13. Question 30: If you are involved in disease management, how do you handle this workload?

For San Diego: The three personnel responded that they have added two flex nurse positions for management of Asthma and Hematology/Oncology populations. The clinic planned to add more RNs, a Health Promotion Coordinator, and a Respiratory Technician through a RSA. The adjustment for the workflow processes was to add appointments for these individuals. Their response to this question conflicts with questions 28.

For Bremerton: Both participants did not answer the question.

14. Question 31: Are there any available documents that “map” the workflow/or processes of the various services provided within your clinic?

For San Diego: Two responded yes and one did not answer the question.

For Bremerton: One participant said no and the other said yes.

F. THEME THREE (MANPOWER AND PERSONNEL) FOR BOTH MTFS

Manpower and personnel theme covers questions 13 through 16 and 32 through 43. It depicts how well the total size and mix of staff requirements match the workload incurred to operate the clinic. It addresses the necessary credentials of providers in order to provide care to eligible beneficiaries. Additionally, it sought information regarding the clinic's use of other sources to staff the clinic such as TRICARE Resource Sharing Agreements and Resource Support to meet workload demands.

1. Question 13: How well does the mix and size of your total staff requirement match the hospital's staffing model for your clinic?

For San Diego: The Director for Pediatric Nursing was unaware of a staffing model used for Pediatric Clinic. The clinic used the model of staff to provider ratio written by Henry (1998) for the American Academy of Ambulatory Care Nursing (AAACN) Viewpoint, to determine the number of Registered Nurse (RN), Licensed Practical Nurse (LPN), Medical Assistant (MA), and medical clerks. The responses of the two subjects for the mix and size of the clinic's total staff were enumerated by billet percentage of military and civil service, which was equivalent to 95 percent filled; and the contract Resource Sharing Agreement (RSA) billet percentage filled by positions were: RNs-90 percent, LPNs-75 percent, and MAs and clerks-80 percent.

For Bremerton: One participant stated that to meet full capacity needs for the clinic, the clinic needs one more RN and two to three more HMs. The other respondent did not answer the question.

2. Question 14: What criteria were used to determine the number and mix of civilian staff needed to augment your military staff?

For San Diego: The three participants responded about the criteria used to determine the number and mix of civilian staff came from the American Academy of Ambulatory Care Nursing (AAACN) guidelines.

For Bremerton: One participant answered "don't know," and the other answered, "overall patient load and acuity level of patients."

3. Question 15: Do your providers have a productivity rate (i.e., Managed Care productivity ratio of Total Visits over Total Enrolled Patients) to strive for?

For San Diego: Two out of three participants answered yes, but did not explain further what the productivity rate entails.

For Bremerton: Out of the two respondents, one said yes and the other said no.

4. Question 16: If volunteers are used in your clinic, what services were provided, how many, and how often?

For San Diego: Two responded that they have two volunteers in the category of administrative assistant for physical therapy and check-in, two days per week.

For Bremerton: Two participants responded to “not applicable.”

5. Question 32: What are the required credentials for physicians to work in the Pediatric Outpatient Clinic?

For San Diego: Three participants responded that providers must be Board Certified or Board Eligible in General Pediatrics, must meet the Command Credentialing requirements, Pediatric Advanced Life Support (PALS) certified, and should be interviewed for the position.

For Bremerton: Both participants answered that providers must have current professional license and must meet the credentialing requirements of the hospital.

6. Question 33: What are the required credentials for nurses (NPs, RNs, and LPNs) to work in the Outpatient Pediatric Clinic?

For San Diego: Three responded that nurses must be Board Certified, must meet the Command’s Credentialing requirements, and be PALS certified, and must have Pediatric Immunization Certification (PIC).

For Bremerton: The two participants responded that NPs, RNs, and LPNs must have current professional license and must meet the credentialing requirements of the hospital.

7. Question 34: What are the required credentials for HMs/ technician to work in the Outpatient Clinic?

For San Diego: Three participants responded the same about the required credentials for HMs, which are Basic Life Support (BLS), PIC, and Pediatric Medication Certification in order to work in the Pediatric Outpatient Clinic.

For Bremerton: Both participants answered by providing the position description information for HMs.

8. Question 35: On average, how often are your military providers and nursed gone from you clinic for readiness training?

For San Diego: Their responses were eight to ten days per year and an added five days per quarter if the mobilization platform is the United States Naval Ship Mercy.

For Bremerton: One did not answer the question and the other participant answered two weeks per provider.

9. Question 36: What are the physicians and nurses' Continuing Medical Education (CME)/ Continuing Educational Units (CEU) requirements per year?

For San Diego: The responses of the three participants were; for physician 25 CME hours a year are required per state guidelines and CEU for RN depends on the state where they received their Board Licensure.

For Bremerton: Both responded that physician and nurse CME/CEU requirements vary from state to state.

10. Question 37: What are the Medical Expense and Performance Reporting System (MEPRS) codes that are used to capture your workload?

For San Diego: Two respondents wrote the following codes, which were BDAA-Pediatric Clinic, BDAB-Pediatric Sub-specialties, and BDAA-Adolescent Clinic. The third participant did not answer the question.

For Bremerton: Two participants responded the BDAA - General Pediatrics and BDZA-Development Pediatrics.

11. Question 38: Is the specialty patient visit combined in your workload data?

For San Diego: The responses of two participants were that specialty patient visit MEPRS codes were separated from the General Pediatric code of BDAA. It is under the code of BDAB – Pediatrics Sub- Specialties.

For Bremerton: Yes, specialty visits such as cardiology patient and endocrinology patients that came from Madigan Army Medical Center, Tacoma, Washington for follow-up are combined, except for the Developmental Pediatrics patients, which is under the MEPRS code of BDZA.

12. Question 39: Does the MEPRS system accurately reflects the resources utilized in the delivery of outpatient pediatric services?

For San Diego: None of the respondents answered the question.

For Bremerton: Their responses were “not sure.”

13. Question 40: Was there any analysis (i.e., Business Case Analysis, Most Efficient Organization, or Benchmarking) conducted to determine what types of services would be provided “in-house” and which services would be provided “outside” by the civilian sector?

For San Diego: Two participants answered the question that during the evaluation of RSA agreement, a Bench Case Analysis method was used to determine the types of services provided either “in house” or “outside” the MTF. The third participant did not answer the question.

For Bremerton: Both participants did not answer the question of whether the clinic did an analysis or not.

14. Question 41: When was the last time Efficiency Review (ER) done, now called Shore Manpower Requirement Determination Program (SMRDP)?

For San Diego: Two participants answered “unsure” and the other participant answered, in “1995.”

For Bremerton: Both participants did not answer the question.

15. Question 42 and 43 are linked: Has the ER or Shore Manpower Requirement Determination Program (SMRDP) been updated and when?

For San Diego: Three participants did not answer the question.

For Bremerton: Both participants left the question blank.

IV. ANALYSIS OF DATA

A. CHAPTER OVERVIEW

This chapter presents the analysis of the data from responses to the survey questions given to Naval Medical Center San Diego (NMCSD) Pediatric Outpatient Clinic and Naval Hospital Bremerton (NHB) Pediatric Outpatient Clinic using theme two of the survey instrument – “clinical services provided” as the main focus. Themes one and three add supportive data to theme two. Theme two – “clinical services provided,” addresses questions 17 through 31 (See Appendix A). Question 17 is the center of the analysis for theme two. Question 17 asked the subjects to weight several variables as to the importance in determining staffing issues. The variables mentioned in question 17 were further examined by asking questions 18 through 31.

B. NMCSD ANALYSIS OF THEME TWO – CLINICAL SERVICES

PROVIDED

The analysis of theme two begins with statistical workload data, which is presented in Table 7, which consists of the catchment area population of the total eligible enrollees, the eligible pediatric enrollees, maximum capacity of TRICARE Prime enrollees, the number of TRICARE Pediatric Prime enrollees and the total pediatric patient visits. NMCSD Pediatric Outpatient Clinic has a stated enrollment capacity of 17,000 for TRICARE Prime patients. The current TRICARE Prime enrollees are 7,502 patients. For FY99, seven military providers and seven civilian contract providers rendered 116,507 total pediatric patient visits. Based on the assumption that all enrolled patients visited the clinic five times per year, the amount of total patient visits for TRICARE

Prime enrollees would be 37,510 ($=7,502 \times 5$) visits per year, the remaining 78,997 (116,507-37,510) patient visits for FY99 were probably non-TRICARE Prime patients. It seems that the clinic meets the standards for delivering healthcare to TRICARE Prime enrollees, while at the same time delivering healthcare to non-TRICARE Prime patients. Therefore, there is less incentive for eligible beneficiaries to enroll in TRICARE Prime.

On question 17 the three subjects indicated several variables were "very important" in their decision process regarding manpower requirements and allocation: the number of patients seen per hour; complexity of patients; and telephone triage. Two subjects indicated that the following variables were "moderately important": new patient visits, follow-up patient visits, patient education, length of patient clinical visits, service time of patient visits, and waiting time of patient visits. The variable of total laboratory test was marked "not important" at all.

All three subjects reported some inpatient clinical services were now provided in the outpatient clinic, such as Chemotherapy, Blood Transfusion, and Intravenous Therapy (Question 18 and 19). All three subjects also reported that a large number of pediatric patients had asthma, diabetes, and cancer. In an attempt to provide more than just episodic care to these patients, two new Registered Nurses and a Respiratory Technician were hired through the Resource Sharing Agreement (RSA) mechanism of the TRICARE contractor, Foundation Health Federal Services (FHFS). The NMCSD Pediatric Outpatient Clinic has now implemented a secondary prevention process, Disease Management, (Question 29), for each of these conditions.

Table 7. Statistical Workload Data from NMCSD

Catchment Area Population of the Total Eligible Enrollees	500,000 ²¹
Catchment Area Eligible Pediatrics Enrollees	67,000 ²²
Maximum Capacity of TRICARE Pediatric Prime Enrollees	17,000 ²³
TRICARE Prime Pediatric Enrollees	7,502 ²⁴
FY 99 Pediatric Patient Visits	116,507 ²⁵

In spite of many changes in how the clinic delivers healthcare, Military Health System still uses the Joint Health Care Manpower Standard (JHMS) model to calculate the number of providers required for the clinic based on the historical workload of total patient visits. Using this model it would generate a requirement of 36 military and three civilian providers. However, BUMED-15 has authorized 14 military and two civilian providers for NMCSD Pediatric Work Center. See Table 8, which represents the number of required and allowed, types and mix of personnel for the Pediatric Work Center Service of NMCSD according to the JHMS DoD directive. The clinic currently has seven military providers, which stems from NMCSD's THCSSR allocation, and seven civilian providers using the RSA mechanism (see Table 5 in Chapter III). Together the

²¹ The number was taken from the Web Site of NMCSD under the Public Affairs Office, as of the date of March 1999.

²² Ibid.

²³ The number came from Department Head, Analysis and Evaluation, TRICARE Southern California, dated April 24, 2000 in agreement between the MTF Commanding Officer and the Head of Pediatrics Department for FY99.

²⁴ Ibid.

²⁵ The number came from Naval Health Care Support Office, Norfolk, Virginia, dated April 26, 2000. It is from three MEPRS code (BDAA – General Pediatrics; BDAB – Pediatrics Sub-Specialties; and BDBA – Adolescent Clinic assigned to NMCSD for FY99.

number of providers addresses the healthcare needs of the entire pediatric population in the catchment area. It appears that historical workload data is not a good measure in determining the number of providers required for the clinic.

Table 8. NMCSD Activity Manpower Document from JHMS

BILLET TITLE	REQUIREMENT	AUTHORIZED
Military Pediatrician	27	10
Military Pediatrician/ChairDPT	1	0
Military Pediatrician/Neuro	1	0
Military Pediatrician/Pulm	1	0
Military Nurse Practitioner	6	4
Military General Nurse	2	0
HM E4 and above	7	2
HM E3 and below	17	17
Civilian Medical Officer	1	0
Civilian Nurse Practitioner	2	2
Civilian Nurse	4	3
Med Machine Tech	1	1
Vocational Nurse or LPN	7	5
Office Automation	4	1
Medical Clerk	7	5
Clinical Psychiatrist	1	1
Speech Pathologist	1	1
Audiologist	1	1
Occupational Therapist	1	1
Social Worker	2	1
Physical Therapist	1	0
Program Coordinator	1	0
Secretary	1	0

Source: BUMED -15 Activity Manpower Document Billet Sequence Code Range 23900 to 24600, 22 February 2000.

C. NHB ANALYSIS OF THEME TWO – CLINICAL SERVICES PROVIDED

The analysis for Naval Hospital Bremerton (NHB) begins with the statistical workload data cited in Table 9, which consists of the catchment area population of the total eligible enrollees, the eligible pediatric enrollees, maximum capacity of TRICARE Prime enrollees, the number of TRICARE Pediatric Prime enrollees and the total pediatric patient visits. The clinic has a maximum stated capacity for 6,200 TRICARE Pediatric Prime enrollees. The current TRICARE Pediatric Prime enrollees are 5,479.

Table 9. Statistical Workload Data from Naval Hospital Bremerton

Catchment Area Population of the Total Eligible Enrollees	55,897 ²⁶
Catchment Area Eligible Pediatrics Enrollees	16,781 ²⁷
Maximum Capacity of TRICARE Pediatric Prime Enrollees	6,200 ²⁸
TRICARE Prime Pediatric Enrollees	5,479 ²⁹
FY 99 Pediatric Total Patient Visits	17,472 ³⁰

²⁶ This number came from Managed Care Forecasting and Analysis System (MCFAS). It is a projection number for FY99 from the actual number of eligible beneficiaries for FY97 and FY98. “MCFAS is a CEIS decision support system (DSS) used to forecast the number of people eligible for medical benefits through the Military Health System (MHS). MCFAS replaced the Resource Analysis and Planning System (RAPS) legacy system that was turned off last December. MCFAS is a worldwide system that contains projections of eligible beneficiaries for all TRICARE regions. This personal computer based client/server application is available to all Medical Treatment Facilities, Lead Agent offices, Intermediate Commands, offices of the Surgeons General, and DoD personnel to assist in their planning for serving beneficiaries over the next eight years.” (MCFAS Information, <http://www.ceis.ha.osd.mil>, no date)

²⁷ This number came from MCFAS calculation for FY99 using the actual Pediatrics enrollees of FY97 and FY98. (Telephone conversation O’Donnell, May 2000).

²⁸ The number came from the Head, Managed Care Department, NHB. See Chapter III for description on how this number came to existence. (Telephone conversation, LTjg Klemmann, April 2000).

²⁹ Ibid.

³⁰ The number came from Naval Health Care Support Office, Norfolk, Virginia, dated April 26, 2000. It is from the two MEPRS code (BDAA – General Pediatrics and BDZA – Developmental Pediatrics assigned to NHB).

The clinic's total patient visits for FY99 were 17,472, which equates to 3.2 (=17,472/5479) average number of visits per each Pediatric Prime enrollee.

On question 17, one subject indicated none of the variables were considered "very important," rather the following variables were "moderately important": the volume of patients seen per hour, complexity of patients, new patients visits, follow-up patients, telephone triage, patient education, patient length of visits, patient's service time, and patient's waiting time. The same subject indicated "total laboratory test" was "not an important" variable in the decision process of manpower requirements and allocation. The other respondent indicated the following variables were "very important": volume of patients seen per hour and total laboratory test. The same subject indicated as "moderately important" the following variables: complexity of patients, new patient visits, follow-up visits, telephone triage, patient education, patient length of visits, patient service time, and patient waiting time.

Both subjects indicated "no" inpatient clinical services were transferred to the outpatient clinic (Questions 18 and 19). Both subjects indicated that the clinical services provided were (Question 22) "based on the skills and interest of the military providers" not based on the TRICARE program benefit package nor the needs of the population. Also both subjects indicated that in the "near future" the clinic would be involved in the Disease Management processes and Health Promotion activities (Question 29).

Today, the Military Health System using the JHMS model, which is based on historical workload of total patient visits, calculates the number of required providers, which equates to 10 military and zero civilians as seen in Table 10. BUMED-15 authorizes to have nine military providers and zero civilians. The clinic, however, has six

military providers, which stems from NHB's THCSSR allocation and two contract civilian providers using the RSA mechanism (see Table 6 in Chapter III). Again, it does not appear to be useful or relevant to use historical workload data to determine staff requirements.

Table 10. NHB Activity Manpower Document (AMD) from JHMS

BILLET TITLE	REQUIREMENT	AUTHORIZED
Military Pediatrician/ChairDPT	1	1
Military Pediatrician	6	5
Military Pediatrician/CUIC	1	1
Military Nurse Practitioner	2	2
Military General Nurse	0	0
HM E4 and above	2	1
HM E3 and below	2	1
Civilian Medical Officer	0	0
Civilian Nurse Practitioner	0	0
Civilian Nurse	2	2
Practical Nurse	1	1
Medical Clerk	1	1

Source: BUMED – 15, Activity Manpower Document Billet Sequence Code Range 23900 to 24655, 11 February 2000.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. CHAPTER OVERVIEW

This last chapter presents the findings of the primary and secondary questions delineated in Chapter I. Second it will provide the thesis conclusion. Finally, the recommendation for further research is presented.

B. FINDINGS OF PRIMARY AND SECONDARY QUESTIONS

The primary question addressed by this study was "What variables influence the determination of manpower requirements at large and medium Navy medical outpatient pediatric clinic?" The subsidiary questions were:

- How does the TRICARE managed care program affect medical manpower requirements with respect to delivering the necessary healthcare for both military members and eligible non-military beneficiaries (i.e. military family members and military retirees)?
- How do the principles of Population Health Management (PHM) influence the military healthcare delivery system and the structure of military medical manpower?

The TRICARE program influences the manpower requirements by introducing the mechanism of enrollment, Primary Care Manager (PCM), utilization review, and patient's choice about "out of pocket expense." Enrollment allows the hospitals to be able to anticipate workload and institute processes that focus on enhancing the health of the enrollee. The PCM provides continuity of care by managing and coordinating the healthcare of the patients. Utilization management monitors the amount and appropriateness of health services used by the patients. The three options of the

TRICARE Program, HMO, PPO or discounted fee-for-service allows the beneficiaries to choose what level of “out of pocket expense” they will incur.

The implementation of PHM principles focuses on prevention and control of the diseases in the population vice only episodic care. The principles of PHM influence the healthcare providers to focus on secondary prevention services (vice episodic care), which is now consistent with the military medical doctrine of Force Health Protection (FHP). Military medical manpower now concentrates more on educating the patients regarding behavioral risk factors that contributed to the illness and disease conditions than ever before.

C. CONCLUSIONS

Historically, the United States healthcare system and the Military Healthcare System (MHS) have delivered healthcare and measured their workload using episodic services from a retrospective view. These historical workload measures, such as number of inpatient admissions, outpatient visits, and occupied bed days, drove the next fiscal year’s budget as well as the number of staff for the medical facility.

To date, the Joint Healthcare Manpower Standards (JHMS) directive uses the historical workload as a way to measure manpower standards for peacetime mission. The DoD encouraged military medical services to find a model that would determine manpower requirements for both peacetime and wartime missions. Presently, Navy Medicine has a way of determining military medical manpower staff for wartime mission using the Total Health Care Support Readiness Requirement (THCSRR) model. But there still remains a need to find the variables that would determine how to staff a Military Treatment Facility (MTF) in the present peacetime setting. Influencing factors

that make it more complex to determine manpower requirements include, but are not limited to, the reduction in the size of the military force, the increase in healthcare costs, and the payors' demand for better quality at reduced costs.

Chapter II discussed some possible variables used by the civilian medical sector in staffing their medical facility. The study of Mourek and Colbert used patient intensity, amount of service time for the patient, and the intensity of service for the patients as some of the variables used to determine their medical staff. Kaiser Permanente used the combination of patient visits, population membership for the managed care organizations, number of providers, and visit acuity variables as their variables to develop a staff-to-provider ratio model.

Clearly, the respondents in this study indicated they have shifted their perspective in determining and allocating manpower resources to be more consistent with the civilian sector's perspective than the military's staffing model. More inpatient procedural services have moved to an outpatient setting, disease management processes are being put in place, and lastly, patients are becoming more involved with their healthcare.

These are some good examples of how much change has taken place in healthcare delivery today. Presently, the MTF is not incentivized to provide only episodic care, but rather to work at improving the health of the beneficiary population. Additionally, the issue of finding the most efficient means to accomplish this goal is more important today than 15 years ago. Finally, military billets are determined not on their workload but on their utility to the military as regards to their specialty in a readiness setting, using the THCSSR model. The military personnel assigned to MTFs are not based on the beneficiary population requirements, but rather on the manning requirements for

deployable units the MTF supports. As indicated, frequently the Joint Healthcare Manpower Standard model justifies staffing levels that are two times larger than necessary in a managed care environment. Therefore, allocating manpower requirements based on historical workload is no longer an appropriate methodology. The bottom line: changes in the delivery of healthcare are ahead of the policy related to manpower requirements.

D. AREAS FOR FURTHER RESEARCH

The focus of this study was to determine the variables of manpower requirements that influence the decision-makers. Building on the lesson learned from the civilian sector and the findings of this study, conduct research to develop a new manpower model for medical staffing for the peacetime mission that is relevant in a managed care environment.

APPENDIX A. LETTER OF REQUEST

11 January 2000

LT Jeanne M. Sarmiento
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E-mail: jmsarmie@nps.navy.mil

Greetings:

This is a letter of introduction and a request for assistance in a Master's Thesis research project on the Manpower Requirements of Outpatient Nurses in the United States Navy.

My name is LT Jeanne M. Sarmiento and I am an active duty Nurse Corps officer and a graduate student at the Naval Postgraduate School working on a Master's of Science degree in Manpower Systems Analysis.

My master's thesis research is titled "Determining the Variables that Influence the Total Number of Ambulatory Nurses Required to Support a Pediatric Outpatient Clinic." This project is undertaken with the knowledge of Manpower Division, MED 153 (CDR Paula Jonak) and MED 03 (CAPT Charles Davis). Military Treatment Facilities that have been identified for participation are: Naval Medical Center San Diego and Naval Hospital Bremerton.

You are requested to participate, by completing the attached questionnaire, being available by phone to clarify your responses, if needed; and by identifying other individuals at your facility who you think should be involved in providing information. At Naval Medical Center San Diego and Naval Hospital Bremerton the addressees were identified as critical in the process of determining manpower requirements in the Outpatient Pediatric Clinic. It is understood that you may not be able to answer every question in the questionnaire. Just answer the ones you can. I would like to have the questionnaire back by **January 28th**. You can send your response electronically or to the above fax numbers.

I will follow this letter with a phone call in order to answer any questions you may have. Individual responses are kept strictly confidential. Only group responses will be reported. Feedback will be provided at the end of the project upon request.

I am available to be contacted any time at your convenience at the above number. Your participation is greatly appreciated. Thank you for your assistance.

Very Respectfully,

Jeanne M. Sarmiento
LT, NC, USN

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APPENDIX B. SURVEY QUESTIONNAIRE OF OUTPATIENT CLINIC WORKLOAD

I am seeking to identify the variables that determine the number of nurses, total Full Time Equivalents required to operate a pediatric outpatient clinic within a military hospital setting such as Naval Medical Center, San Diego and Naval Hospital Bremerton. The purpose of this survey is to determine manpower requirements in the Outpatient Pediatric Clinic.

The following questions attempt to capture these variables. Your assistance in responding to them is appreciated. I would like to have the questionnaire back by January 28th. You can send your response electronically or faxed it to (831) 656-2138 or (831) 656-1098.

1. What is the pediatric outpatient clinic called? _____
2. Is your clinic part of (Please circle one.)
 - a. Large Medical Treatment Facility (MTF)
 - b. Medium Size MTF
 - c. Branch Clinic
3. What are the normal operating hours of your clinic? (Please circle one.)
 - a. 8 hrs per day Monday to Friday
 - b. 9 hrs per day Monday to Friday
 - c. 8 hrs per day Monday to Saturday
 - d. 8 hrs per day Monday to Friday and 4 hrs on Saturday
 - e. Other: _____
4. Is the workday ever extended?
 - a. Yes
 - b. No
 - c. I do not know.
5. If yes, who commonly stays? (Circle all that apply.)
 - a. Military personnel
 - b. Civilian employee
 - c. Contract employee
 - d. Reserve personnel

6. What types of reserve personnel have augmented your clinical staff? (Circle all that apply.)

- a. Physician
- b. Pediatric Nurse Practitioner
- c. Registered Nurse
- d. Hospital Corpsmen
- e. None.

7. How often have drilling reserve personnel augmented your clinic? (Circle all that apply.)

- a. Once a week
- b. Once every two weeks
- c. Once a month
- d. Other: _____

8. How important are the expectations of the Commanding Officer and the Executive Steering Committee regarding your outpatient clinic's ability to undertake workload from the civilian sector?

- a. Very Important
- b. Moderately Important.
- c. Not Important.

9. How many military staff are assigned to your clinic? (Please fill-in table.)

Types of Staff	Number of Military Staff Assigned to Clinic
a. Physicians	
b. Pediatric Nurse Practitioner (NP's)	
c. Registered Nurses (RN's)	
d. Hospital Corpsmen (HM's)	
e. Other	

10. How many **civilian** and **contract staff** are assigned to your clinic?

Types of Staff	Number of Civilian Staff	Number of Contract Staff
a. Physicians		
b. Pediatric Nurse Practitioner (NP's)		
c. Registered Nurses (RN's)		
d. Licensed Practical Nurses (LPN's)		
d. Certified Nursing Assistant (CNA's)		
e. Other		

11. Does your clinic meet the total workload requirements (of meeting the Tricare access standards)? (Workload could be patient or clinic related. **Patient workload** is defined as a relative value, which represents a patient's need for labor resource consumption. While, **clinic workload** is combinations of patient visit types included on-site, off-site, and telephone interactions. The **patient visit types** were subdivided into several categories including: **length of visit** - time of arrival in the clinic until clinical disposition; **service time** - time period from initial clinical contact until clinical disposition; and **waiting time** - time period from arrival in the clinic until initial clinical contact.)

- a. Yes
- b. No
- c. I do not know.

12. If not, what resources do you use to meet your workload requirements? (Circle all that apply.)

- a. Resource sharing
- b. Resource support
- c. Direct hiring (part or full time Government Service employee).
- d. Reserve Support
- e. Volunteers
- f. Other: _____

13. How well does the mix and size of your total staff requirements match the hospital's staffing model for your clinic? _____

14. What criteria were used to determine the number and mix of civilian staff needed to augment your military staff? _____

15. Do your providers have a productivity rate (i.e., Managed Care productivity ratio of Total Visits over Total Enrolled Patients) to strive for?

- a. Yes
- b. No
- c. I do not know

16. If volunteers are used in your clinic, please fill in the following chart:

Services Provided	How many volunteers within this category?	How often does the average person in this category volunteer?
A. Administrative		
B. Information Desk		
C. Other		

17. How important are these variables in the decision process of manpower requirements for your clinic?

Variables	Very Important	Moderately Important	Not Important
1. Volume of Patients Seen Per Hour			
2. Complexity of Patients			
3. Patient Type Visits *			
a. New Patients			
b. Follow-up Visits			
4. Total Laboratory Test			
5. Telephone Triage			
6. Patient Education			
7. Patient Clinical Visits*			
a. Length of Visit			
b. Service Time			
c. Waiting Time			

*The difference between 3 and 7 are: the key factor for number 3 relates to amount of information the provider has about the patient; number 7 is the quantification of patient type visits.

18. Are there any clinical services now provided on an outpatient basis at your clinic that were once provided on an inpatient basis?

- a. Yes
- b. No
- c. I do not know.

19. If yes, what are they? (Circle all that apply.)

- a. minor removal of cysts
- b. peg tube replacements
- c. post-op dressing changes
- d. spinal taps
- e. complex dressing changes
- f. irrigation or packing of wounds/incisions
- g. Intravenous (IV) therapy
- h. Other: _____

20. This is a two-part question. What procedures have been added to the clinic workload? With these procedures did the clinic's manpower workload requirements changed? (Check all that apply.)

- a. minor removal of cysts
- b. peg tube replacements
- c. post-op dressing changes
- d. spinal taps
- e. complex dressing changes
- f. irrigation or packing of wounds/incisions
- g. Intravenous (IV) therapy
- h. Other: _____

21. How do patients access the clinic's services at your clinic? (Check all that apply.)

- a. Walk-in
- b. Appointment
- c. Referral from ER
- d. Telephone encounters
- e. Other Departments within the hospital
- f. Primary Care Managers from other military facilities in the region
- g. Civilian providers
- h. Other: _____

22. By what means are the clinical services provided at your clinic?

- a. Based on the skills and interest of the military providers assigned to the clinic.
(Do the pediatric outpatient clinic have a residency program or have an internship program for providers?)

- b. Based on the TRICARE benefit package (Managed Care support contract agreement) available to eligible beneficiaries.

- c. Other: _____

23. Does your clinic have capacity to provide services to other than PRIME beneficiaries?

- a. Yes
- b. No
- c. I do not know.

24. Are the PRIME access standards being met at your clinic?

- a. Yes
- b. No
- c. I do not know.

25. Did the requirement to meet PRIME access standards involve bringing additional staff into the clinic?

a. Yes
b. No
c. I do not know.

26. Do your physicians also provide care for inpatients?

a. Yes
b. No
c. I do not know.

27. Does your clinic provide special services, such as:

a. Exceptional Family Member Program
b. Adolescent Clinic
c. Well-Baby Clinic
d. Other: _____

28. Is your clinic responsible for implementation of the Health Promotion Program for a specific enrolled population?

a. Yes
b. No
c. I do not know.

29. Is your clinic involved in any disease management or health promotion activities?

a. Yes
b. No
c. I do not know

30. If you are involved in disease management, how do you handle this workload?

a. Do you require additional staff? _____

b. Was there an adjustment in the clinic workflow processes? _____

c. Other: _____

31. Are there any available documents that “map” the workflow/or processes of the various services provided within your clinic?

a. Yes
b. No
c. I do not know

32. What are the required credentials for physicians to work in your Outpatient Pediatric Clinic? _____

33. What are the required credentials for nurses (NPs, RNs, and LPNs) to work in your Outpatient Pediatric Clinic? _____

34. What are the required credentials for corpsmen/technicians to work in your Outpatient Pediatric Clinic? _____

35. On average, how often are your military providers and nurses gone from your clinic for readiness training? (Readiness training includes C4, PRT, C1 status and others.) _____

36. What are the physician and nurse CME/CEU requirements per year? _____

37. What are the MEPRS codes that are used to capture your workload? _____

38. Is the specialty patient visit combined in your workload data? _____

39. Does the MEPRS system accurately reflect the resources utilized in the delivery of outpatient pediatric services? _____

40. Was there any analysis (i.e., Business Case Analysis, Most Efficient Organization, or Benchmarking) conducted to determine what types of services would be provided “in-house” and which services would be provided “outside” by the civilian sector? _____

41. When was your last Efficiency Review done? _____

42. Has it been updated? _____

43. When was it updated? _____

I appreciate your time answering all the above questions.

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